



Jack pine

(*Pinus banksiana*)

Since 1983, both the **volume and rate of growth of jack pine have decreased** significantly. The number of poles and sawtimber have decreased by 40% since 1996.

Jack pine has a **much higher ratio of mortality to growth** than other species in the state. For instance, jack pine accounts for about 1.1% of all volume and growth of trees in Wisconsin, but 3% of total mortality.

Jack pine is **an important timber species**, accounting for 3.6% of roundwood product in 2009. The total biomass of jack pine is only 1% of the total for all species and the density of jack pine wood is fairly low.



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“How has the jack pine resource changed?”
Growing stock volume and diameter class distribution by year

The [growing stock volume](#) of jack pine in 2012 was about 246 million cft or 1.1% of total volume in the state (Chart 1). This represents a decrease of 53% since 1983 and 37% since 1996.

Volume in growing stock trees is decreasing for [seedling](#), [pole](#) and [sawtimber](#) sized trees (Chart 2).

The number of jack pine trees has decreased for almost all size classes suggesting that jack pine will play a decreasing role in future forests of Wisconsin (Chart 3). Over three-quarters of all jack pine is naturally occurring (i.e. not planted).

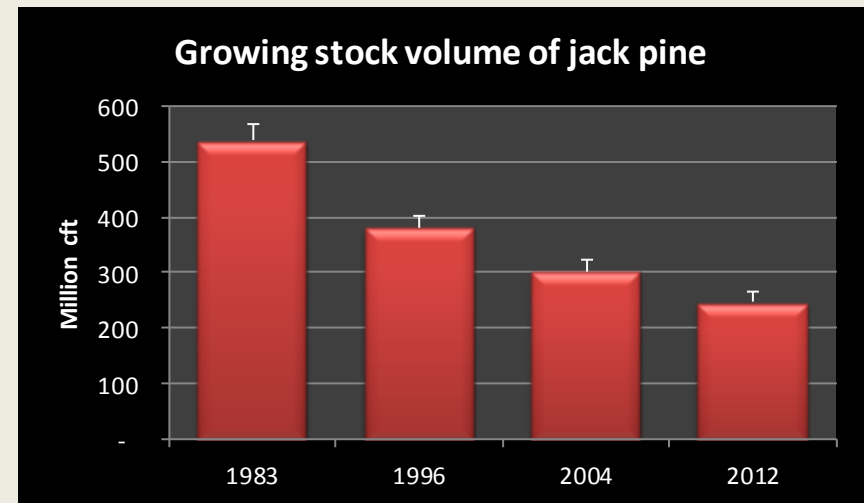


Chart 1. Growing stock volume (million cubic feet) by inventory year.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, 2004 and 2012.

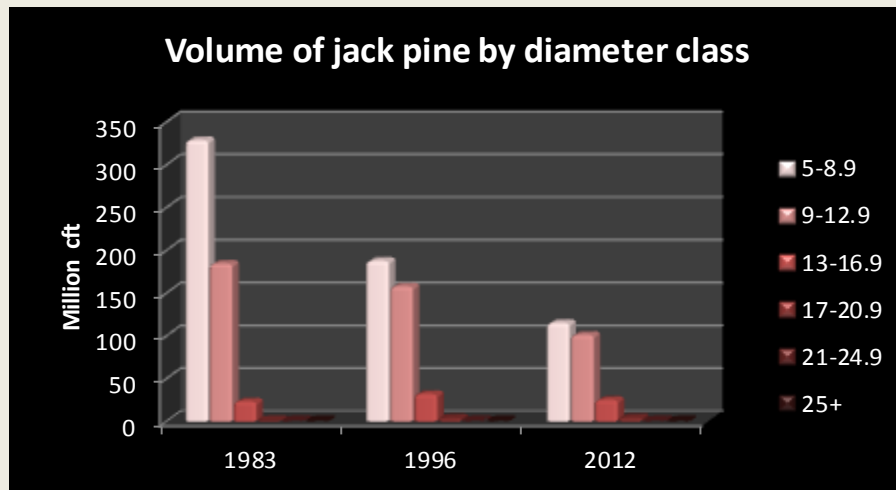


Chart 2. Growing stock volume (trees over 5 inches dbh) in million cubic feet in 1983, 1996, and 2012.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2012.

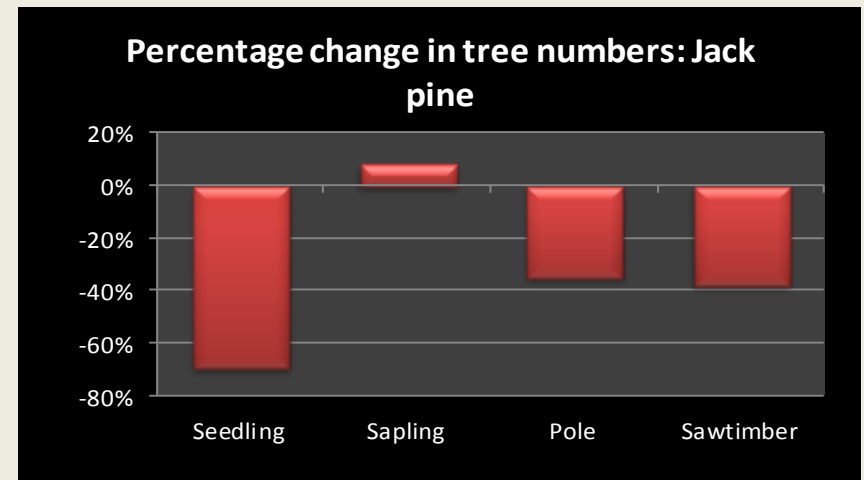
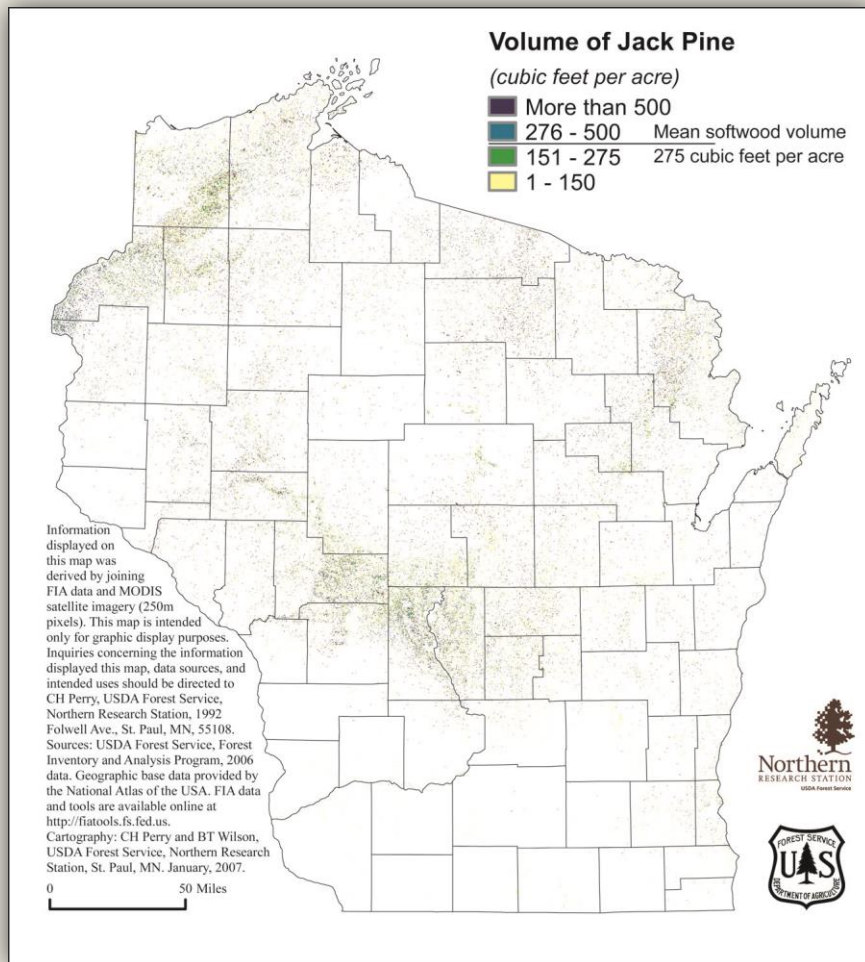


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2012.
 Source: USDA Forest Inventory and Analysis data 1996 and 2012.

"Where does jack pine grow in Wisconsin?"

Growing stock volume by region with map



About $\frac{3}{4}$ of jack pine volume is found in the sandy soils of northwest and central Wisconsin with lesser amounts in the northeast (Table 1).

The vast majority of jack pine volume occurs on pine [forest types](#) with lesser amounts on oak/pine and oak/hickory types.

Table 1. Growing stock volume (million cft) by species and region of the state.

Species	Central	North east	North west	South east	South west	Total
Jack pine	104	54	82	1	5	246
Percent of total	42%	22%	33%	1%	2%	100%

Source: USDA Forest Service, Forest Inventory and Analysis 2012 data

For a table on **Volume by County for 2012** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/VolumeCountySpecies.pdf>



"How fast is jack pine growing?"
Average annual net growth by region and year

Average annual net growth of jack pine has decreased by 74% since 1983 to 6.0 million cft/year currently (Chart 4). This represents about 1.1% of total volume growth in Wisconsin.

Table 2. Average annual net growth (million cft/year) of growing stock and the ratio of growth to volume by region of the state.

Region	Net growth	Percent of Total	Ratio of growth to volume
Central	2.4	40%	2.3%
Northeast	1.6	26%	2.9%
Northwest	2.0	33%	2.4%
Southeast	0.0	0%	-1.1%
Southwest	0.1	1%	1.5%
Statewide	6.0	100%	2.4%

Source: USDA Forest Inventory and Analysis 2012

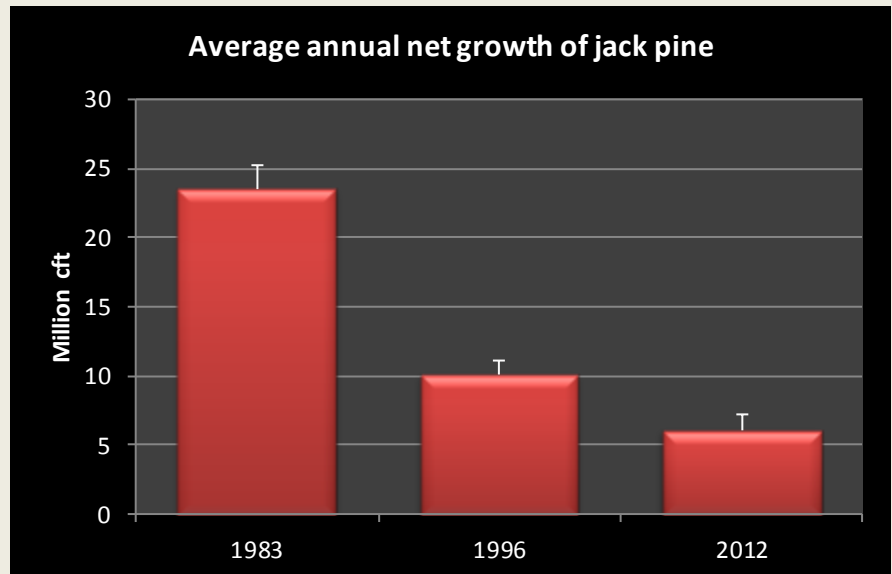


Chart 4. Average annual net growth (million cubic feet).
 Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2004, and 2012

Central Wisconsin has the highest percentage of volume growth in jack pine, 40%, but the highest ratio of growth to volume is in the northeast (Table 2).

The statewide ratio for jack pine is 2.4%, equal to the average of 2.6% for all species.

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How healthy is jack pine in Wisconsin?"

Average annual mortality: 1983, 1996, and 2012

Average annual mortality of jack pine, about 7.0 million cft per year from 2008 to 2012, had more than doubled between 1983 and 1996 but has fallen 19% since 1996 (estimates with high sampling error are suspect).

The ratio of mortality to gross growth is 54% for jack pine (Table 3), much higher than the statewide average of 29.3%. Whereas jack pine accounts for 1.1% of total growing stock volume in the state, this species makes up 3% of total mortality.

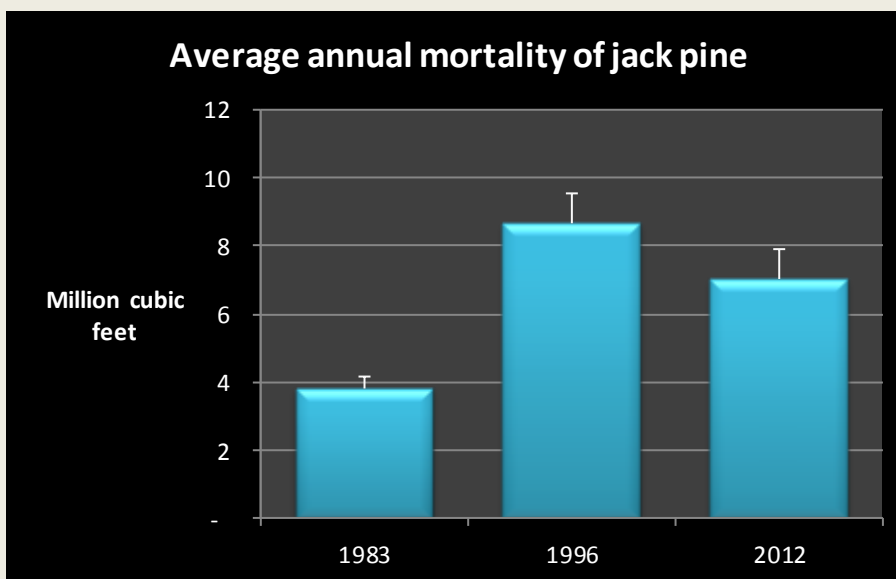


Chart 5. Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012

Table 3. Mortality, gross growth (excluding mortality) and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Jack Pine	7,043,015	13,048,163	54.0%

Source: USDA Forest Inventory & Analysis data: 2012

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How much jack pine do we harvest?"

Roundwood production by product and year

In 2009, jack pine accounted for 13 million cft or 3.6% of Wisconsin's total [roundwood](#) production. About 60% was used for pulpwood and 33% for sawlogs (Chart 6). Jack pine sawlogs account for almost 6% of statewide production.

From 2003 to 2009, pulpwood production had decreased 46%.

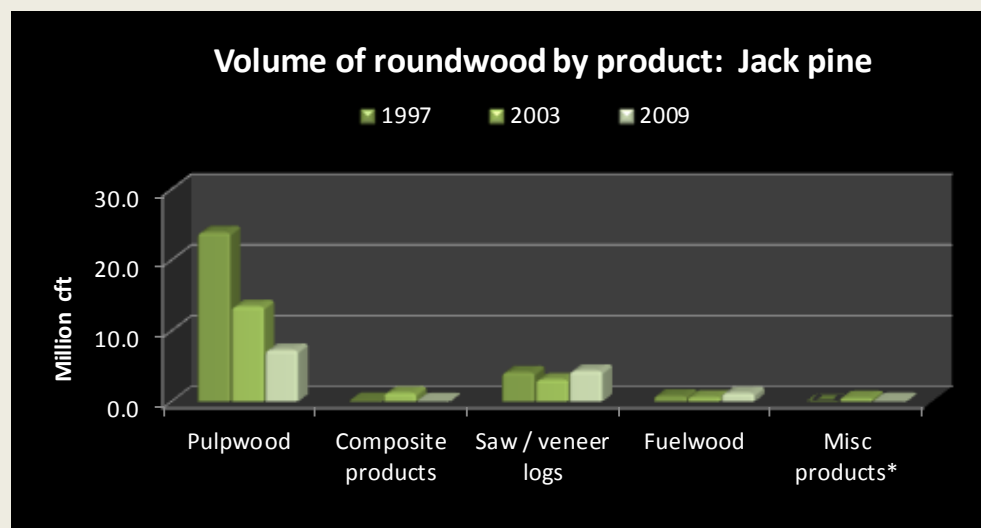


Chart 6. Volume of roundwood products. * Miscellaneous products include poles, posts, and pilings.
Source: Ronald Piva, USDA Forest Service, Northern Research Station, St. Paul MN

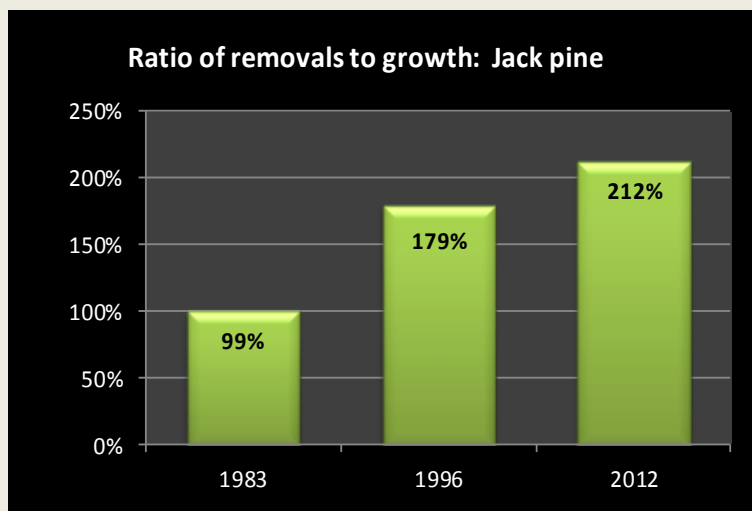


Chart 7. Ratio of volume harvested annually to net growth.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012.

The ratio of removals to growth has more than doubled since 1983 and now stands at 212%, much higher than the average of 53.4% for all species and the highest for any commercial species in the state (Chart 7).

A ratio of 200% means that we are harvesting twice as much wood as is being replaced by growth (minus mortality). This is due to both very high removals and very high mortality.

For a table of **Average annual growth, mortality and removals by region** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How much is jack pine selling for?"

Prices for cordwood & sawtimber: 2000 to present

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: [Timber Mart North](#) and [weighted average stumpage prices](#) from Wisconsin Administrative Code Chapter NR 46.

Prices for jack pine stumpage and delivered pulpwood, as reported in the Timber Mart North (Chart 8), have decreased since 2000.

Average weighted prices for cordwood (Table 4), as reported in NR46, have decreased since 2005 and have varied considerably for logs.

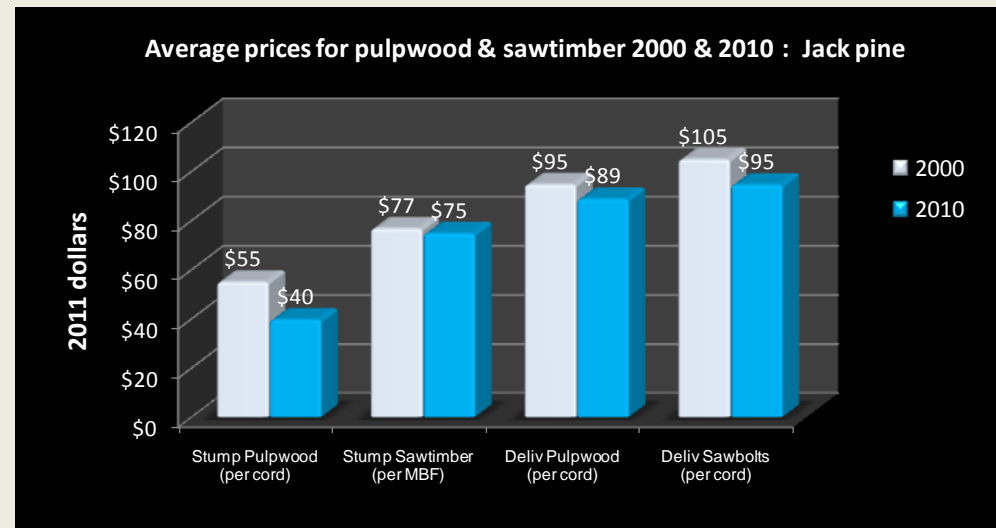


Chart 8. Average prices for cordwood and sawtimber (2008).

Source: Timber Mart North, George Banzhaf & Company, 8301 N. Allen Lane, Milwaukee, WI 53217

Table 4. Average weighted stumpage prices (adjusted for inflation to 2012 dollars) by year for Wisconsin.

Product	2002	2003	2004	2005	2006	2007	2008	2009	2010	2012	Average for all softwoods
Cordwood (per cord)	\$61	\$61	\$59	\$64	\$49	\$36	\$33	\$33	\$32	\$31	\$30
Logs (per MBF)	\$57	\$66	\$76	\$161		\$13	\$81	\$63	\$62	\$75	\$103

Source: Wisconsin Administrative Code Chapter NR46, 2002 to 2012. The stumpage values calculated each year are for the sole purpose of assessing MFL yield and FCL severance taxes, not for determining the price that should be received for timber.



"How much jack pine biomass do we have?"

Aboveground carbon by region of the state

There were 5.9 million tons of aboveground [biomass](#) in live jack pine trees in 2012, a decrease of 50% from 1983. This is equivalent to approximately 3 million tons of carbon and represents 0.9% of all biomass statewide. As with volume, most of the ash is located in northwest and central Wisconsin (Chart 9).

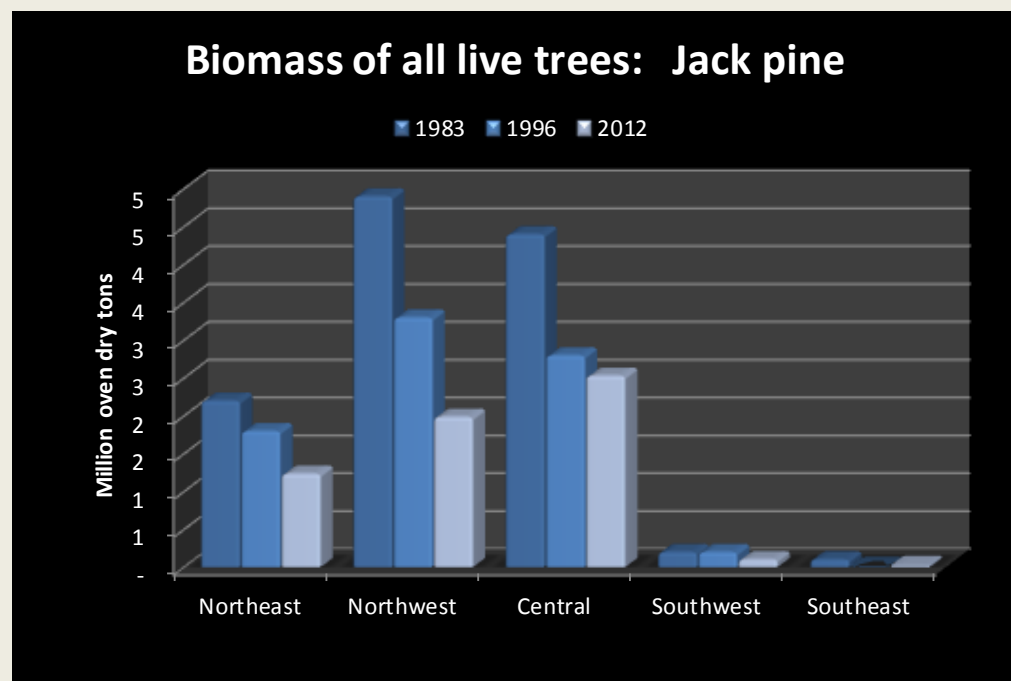


Chart 9. Biomass (above ground dry weight of live trees >1 in dbh, short tons) by year and region of the state.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012

The density of jack pine wood is fairly low with a ratio of biomass to volume of 36.7 oven-dry lbs. per cubic foot (ODP/cft). The average for all softwoods is about 34.3 ODP/cft and for all species is 46.8 ODP/cft. Approximately, 80% of all jack pine biomass is located in the main stem and 15% in the branches.

The low amount of jack pine as well as the low density of its wood may make it a low value species for biomass production.

For a table of **Biomass by County for 2012** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/BiomassByCounty.pdf>